

**Software Requirement Specification**  
**For**  
**Pharmacy Management & Medicine Checker**  
**Version 1.0**

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## Contents

1. Development Model .....	4
2. Full Story of the Project Features .....	4
1. Inventory Management .....	4
2. Medicine Sales & Billing .....	4
3. Customer Public Search (NO account, NO login).....	5
4. Employee Management .....	5
5. Reporting & Analytics.....	5
3. Functional Requirements (FR). ....	5
1. FR-01: Inventory Management .....	5
2. FR-02: Sales and Billing. ....	5
3. FR-03: Customer Public Search (No Registration) .....	6
4. FR-04: Employee Management.....	6
4. Non-Functional Requirements (NFR).....	6
1. NFR-01: Performance Requirements .....	6
2. NFR-02: Security Requirements .....	6
3. NFR-03: Usability Requirements .....	7
4. NFR-04: Reliability Requirements .....	7
5. NFR-05: Data Storage Requirements .....	7
6. NFR-06: Scalability.....	7
7. NFR-07: Availability .....	7
8. NFR-08: Localization .....	7
5. Full Requirements of Each Part of the Pharmacy Management System .....	7
1. Inventory Management Module – Full Requirements.....	7
1.1 Medicine Information Management .....	7
1.2 Stock Tracking .....	8
1.3 Expiration Management.....	8
1.4 Supplier Link .....	8
2. Sales & Billing Module – Full Requirements .....	8

2.1 Medicine Search .....	8
2.2 Invoice Creation.....	9
2.3 Record:.....	9
2.4 Completing the Sale: .....	9
3. Customer Management Module – Full Requirements.....	9
3.1 Customer Medicine Search Screen .....	9
4. Employee Management Module – Full Requirements .....	10
4.1 Employee Accounts .....	10
4.2 Role-Based Access Control .....	10
5. Reporting Module – Full Requirements .....	10
5.1 Sales Reports .....	10
6. Non-Functional Requirements – Constraints, Limitations, External & Organizational Requirements .....	11
6.1 System Constraints .....	11
6.2 Technical Limitations .....	11
6.3 External Requirements.....	12
6.4 Organizational Requirements .....	12
7. Metrics for Non-Functional Requirements (Measurable & Verifiable) .....	13
8. Primary Use Cases of the System.....	13
9. Database Requirements.....	15
Database Type .....	15
Database Design Requirements.....	15
Main Tables.....	15
Entity Relationship Diagram (ERD): .....	19
Class Diagram: .....	20
10. Required UI Screens .....	21
10.1 Login Screen (Employees Only).....	21
10.2 Dashboard Screen .....	21
10.3 Inventory Management Screen .....	22
10.4 Add / Edit Medicine Screen .....	22

10.7 Public Medicine Search Screen (No Login Required) .....	24
10.8 Session Timeout & Logout Screen .....	24
Real Screens For the Admin Part: .....	25
Real Screens for the Customer Part: .....	29
.....	33
11. High-Impact Risks Related to Development.....	33
11.1 Technical Risks .....	33
11.2 Security Risks.....	34
11.3 Time and Schedule Risks .....	34
11.4 Data Accuracy Risks.....	34
11.5 User Error Risks .....	35
11.6 Performance Risks .....	35

## 1. Development Model

### Chosen Model: Incremental Development Model

#### Explanation (Why Incremental is chosen)

The Pharmacy Management System will be built using the **Incremental Development Model**, where every set of features will be delivered in fully working increments.

We chose incremental because:

1. **The project includes many core modules** (Inventory, Sales, Customer Management, Employee Management, Reporting). Incremental development allows building and delivering each module in a structured sequence.
2. **Earlier increments help us test and validate the system step-by-step**, reducing errors in later stages.
3. **Project timeline requires visible progress**. Incremental delivery guarantees that every week a new functional part is completed.
4. **Risk is minimized** because each increment is fully tested before moving to the next.
5. **The system structure is modular**, and each module works independently (e.g., you don't need the reports module to finish the sales module).
6. **Easy for a student project** to demonstrate progress to the doctor and submit parts on time.

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## 2. Full Story of the Project Features

### 1. Inventory Management

The pharmacist adds all medicines to the system with complete details including name, category, barcode, type, expiration date, quantity, price, supplier, and storage location.

The system tracks the quantity of each medicine automatically after every sale.

When a medicine reaches the minimum quantity, the system alerts the pharmacist.

Expired medicines are highlighted, and the system prevents selling an expired product.

### 2. Medicine Sales & Billing

The pharmacist scans or searches for a medicine and adds it to the invoice.

The system calculates the total price, adds discounts if applicable, and generates a digital invoice.

When the sale is completed, the system deducts the sold quantities from inventory.

The pharmacist can print the invoice or save it in the system for reporting.

### 3. Customer Public Search (NO account, NO login)

This is a **public module**.

Anyone can search for **medicines and check availability**.

The system displays basic medicine information (price, type, availability, prescription requirement).

No customer registration exists. No data stored.

### 4. Employee Management

Each employee has a role (Admin), username, password, and permissions.

Admins can add, edit, and remove employees.

The system monitors login history and activities.

### 5. Reporting & Analytics

The system generates reports including:

- Daily sales
  - Weekly sales
  - Monthly sales
  - Inventory status
  - Near-expiry medicines
  - Out-of-stock medicines
  - Top-selling medicines
  - Total income
- 

### 3. Functional Requirements (FR).

#### 1. FR-01: Inventory Management

- **FR-01-01:** The system shall allow adding medicines with all required details.
- **FR-01-02:** The system shall update quantities after each sale.
- **FR-01-03:** The system shall display alerts for low stock.
- **FR-01-04:** The system shall prevent the sale of expired items.

#### 2. FR-02: Sales and Billing.

- **FR-02-01:** The system shall allow searching for medicines.
- **FR-02-02:** The system shall allow adding medicines to an invoice.

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- **FR-02-03:** The system shall calculate the total price automatically with no discounts applied.
- **FR-02-04:** The system shall generate a final invoice with a unique invoice ID.
- **FR-02-05:** The system shall save all invoices in the database.
- **FR-02-06:** The system shall reduce inventory quantities automatically after confirming the sale.

### **3. FR-03: Customer Public Search (No Registration)**

- **FR-03-01:** Allow public users to search medicines by name or category.
- **FR-03-02:** Display availability, price, type, and prescription status.
- **FR-03-03:** No accounts, no registration, no saving customer data.

### **4. FR-04: Employee Management**

- **FR-04-01:** The system shall create and manage employee accounts.
- **FR-04-02:** The system shall enforce role-based permissions.
- **FR-04-03:** The system shall record login history.

### **5. FR-05: Reporting**

- **FR-05-01:** The system shall generate all sales reports.
- **FR-05-02:** The system shall generate inventory status reports.
- **FR-05-03:** The system shall generate expiry and low-stock reports.
- **FR-05-04:** The system shall generate supplier reports.
- **FR-05-05:** The system shall generate employee activity logs.

---

## **4. Non-Functional Requirements (NFR).**

### **1. NFR-01: Performance Requirements**

- The system shall load inventory data in less than **3 seconds**.
- The system shall support storing up to **10,000** medicine records.

### **2. NFR-02: Security Requirements**

- The system shall encrypt all stored passwords.
- The system shall implement strict role-based access control.

### 3. NFR-03: Usability Requirements

- The system shall provide a clean, easy-to-use interface.
- New users shall be able to learn the system within **30 minutes**.
- The system shall support **English**.

### 4. NFR-04: Reliability Requirements

- System uptime shall be at least **99%**.
- Data shall be auto-saved every **10 seconds**.
- The system shall recover from unexpected shutdowns automatically.

### 5. NFR-05: Data Storage Requirements

- The system shall use a relational database.

### 6. NFR-06: Scalability

- The system **will support** 50 concurrent users at launch and **will scale** to support 500 concurrent users using horizontal scaling.

### 7. NFR-07: Availability

- The system **will maintain** monthly uptime  $\geq 99.9\%$ .

### 8. NFR-08: Localization

- The system **will provide** Arabic and English UI text, date formats, and default time zone set to Africa/Cairo.

---

## 5. Full Requirements of Each Part of the Pharmacy Management System

### 1. Inventory Management Module – Full Requirements

#### 1.1 Medicine Information Management

- The system shall allow adding a new medicine with the following mandatory fields:
  - Medicine Name
  - Barcode
  - Category
  - Type (Tablet/Syrup/Injection/etc.)
  - Manufacturer

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- Expiration Date
  - Quantity in Stock
  - Minimum Required Quantity
  - Purchase Price
  - Selling Price
  - Supplier Name
  - Storage Location (Shelf/Rack/Section)
- The system shall validate that all fields are filled before saving.
  - The system shall ensure the expiration date is not in the past.
  - The system shall prevent duplicate barcodes.

### **1.2 Stock Tracking**

- The system shall automatically decrease stock after every sales transaction.
- The system shall show real-time stock levels for each medicine.
- The system shall generate a “Low Stock Alert” when quantity drops below the minimum.
- The system shall block sales of medicines that have zero stock.

### **1.3 Expiration Management**

- The system shall highlight medicines that are expired.
- The system shall prevent the sale of expired medicines.
- The system shall display a list of medicines that will expire within 30 days.

### **1.4 Supplier Link**

- The system shall link each medicine to its supplier.
- The system shall show full supplier details whenever the pharmacist clicks the supplier's name.

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## **2. Sales & Billing Module – Full Requirements**

### **2.1 Medicine Search**

- Search by name.
- Show available quantity.

## **(SRS Doc of Pharmacy Management System)**

- Prevent adding out-of-stock items.

### **2.2 Invoice Creation**

- 1- Add multiple items.
- 2- Automatic total calculation (NO discounts).
- 3- Calculate tax (if used).
- 4- Generate unique invoice ID.

### **2.3 Record:**

- Date & time
- Items
- Total amount
- Employee who created the invoice

### **2.4 Completing the Sale:**

- Confirm sale.
  - Deduct stock.
  - Save invoice.
- 

## **3. Customer Management Module – Full Requirements**

### **3.1 Customer Medicine Search Screen**

This module is public (no login required).

The system shall allow customers to:

- Search medicines by name or category.
  - View medicine:
    - Availability (In stock / Out of stock)
    - Price
    - Type
    - Basic details
  - View if the medicine requires a prescription.
-

## 4. Employee Management Module – Full Requirements

### 4.1 Employee Accounts

- The system shall allow creating employees with:
  - Full Name
  - Username
  - Password
- The system shall enforce a secure password policy.

### 4.2 Role-Based Access Control

- Admin shall have full access to all system modules.
  - The system shall restrict unauthorized actions automatically.
- 

## 5. Reporting Module – Full Requirements

### 5.1 Sales Reports

- The system shall generate:
    - Daily sales
    - Weekly sales
    - Monthly sales
    - Annual sales
  - Each report shall include:
    - Total number of invoices
    - Total income
    - Number of items sold
-

## 6. Non-Functional Requirements – Constraints, Limitations, External & Organizational Requirements

Non-functional requirements define the **quality attributes, constraints, and operational conditions** under which the Pharmacy Management System must operate. These requirements ensure the system is reliable, secure, usable, and compliant with organizational and external rules.

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### 6.1 System Constraints

- The system shall be developed as a **web-based website** accessible through standard web browsers (such as Google Chrome, Microsoft Edge, and Mozilla Firefox) without requiring any software installation on client devices.
  - The system shall use a **Relational Database Management System (RDBMS)** to ensure structured data storage, consistency, and integrity.
  - The system shall operate on **standard desktop computers** commonly used in pharmacies without requiring specialized hardware.
  - The system shall support only **modern web browsers** that comply with current web standards.
  - The system shall require a stable local or internet network connection to function correctly.
- 

### 6.2 Technical Limitations

- The system shall not support **online or electronic payment processing**; all payments are handled externally.
  - The system shall not store or manage **customer personal information**, as customers do not register or log in.
  - The system shall not support **returns, refunds, or discount management**.
  - The system shall not integrate with **external insurance, banking, or governmental systems**.
  - The system shall not include mobile application functionality.
-

### 6.3 External Requirements

- The system shall comply with **local pharmacy regulations** related to medicine storage, tracking, and expiration management.
  - The system shall clearly label medicines that **require a prescription** to ensure legal compliance.
  - The system shall comply with **basic data protection principles**, including secure handling of employee credentials and system data.
  - The system shall follow general **software quality and documentation standards** required by academic institutions.
- 

### 6.4 Organizational Requirements

- Access to internal system modules shall be restricted to **authorized pharmacy employees only**.
  - Each employee shall be assigned a **unique system account** based on their role.
  - The pharmacy administration shall define and enforce **system usage policies**.
  - All critical employee actions shall be logged for monitoring and accountability.
-

## 7. Metrics for Non-Functional Requirements (Measurable & Verifiable)

To ensure that non-functional requirements are **testable, measurable, and verifiable**, the following metrics will be applied:

Non-Functional Requirement	Metric	Acceptance Criteria
Performance	Page load time	Inventory page loads $\leq 3$ seconds
Scalability	Data capacity	At least 10,000 medicine records
Security	Password protection	Passwords stored using secure hashing
Availability	System uptime	$\geq 99.9\%$ monthly uptime
Reliability	Recovery capability	Automatic recovery after system failure
Usability	Learning time	New user can operate system within 30 minutes
Localization	Language support	Full Arabic and English support
Concurrency	Active users	Support $\geq 50$ concurrent users

## 8. Primary Use Cases of the System

### Actors

- Admin
- Customer (Public User)

### Primary Use Cases

1. Admin logs into the system
2. Admin adds new medicine information
3. Admin updates medicine details
4. Admin performs medicine sales
5. Admin generates and prints invoices
6. Admin views inventory status
7. Admin generates system reports
8. Customer searches for medicines
9. Customer views medicine availability, price, and prescription requirement

(SRS Doc of Pharmacy Management System)

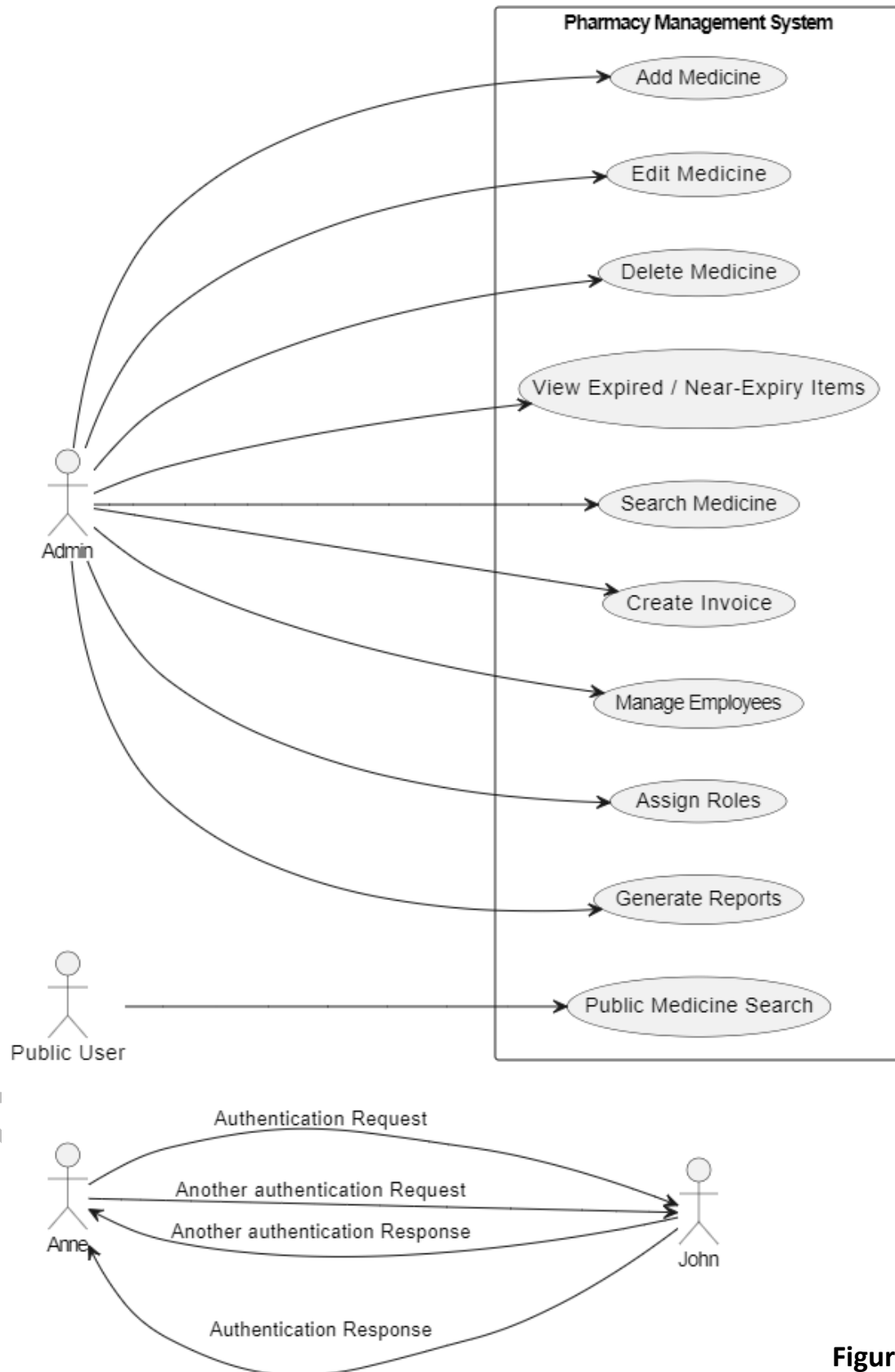


Figure 1

## 9. Database Requirements

### Database Type

- Relational Database Management System (RDBMS)

### Database Design Requirements

- The database shall enforce primary keys for all main entities.
- Foreign key constraints shall be used to ensure referential integrity between related tables.
- Unique constraints shall be applied where required (e.g., username, email, barcode, tag name).
- Check constraints shall be used to restrict valid values (e.g., roles, drug types, quantities).
- Cascade rules shall be applied appropriately for delete operations.
- Default values shall be used for timestamps and numeric fields where applicable.

### Main Tables

#### 1. Admins (System Users)

Stores administrative users such as super admins and cashiers.

**Table: admin:**

admin\_id (Primary Key)

username (Unique)

email (Unique)

password\_hash

role (super\_admin, cashier)

created\_at

#### 2. Admin Logs

Tracks login and logout activities for admins.

**Table: admin\_logs**

log\_id (Primary Key)

admin\_id (Foreign Key → admins.admin\_id)

action\_type (login, logout)

## (SRS Doc of Pharmacy Management System)

action\_time

### Relationship

One admin can have many log records

Deleting an admin deletes related logs (CASCADE)

### 3. Drugs

**Stores detailed information about medicines available in the pharmacy.**

#### Table: drugs

drug\_id (Primary Key)

name

selling\_price

purchasing\_price

barcode (Unique, Nullable)

image\_url

description\_before\_use

description\_how\_to\_use

description\_side\_effects

requires\_prescription (Boolean)

drug\_type (tablet, syrup, injection, capsule, cream, gel, spray, drops)

manufacturer

expiration\_date

shelf\_amount

stored\_amount

low\_amount

sub\_amount\_quantity

created\_at

## **(SRS Doc of Pharmacy Management System)**

### **4. Tags**

**Used to classify drugs (e.g., antibiotic, painkiller, vitamin).**

**Table: tags**

tag\_id (Primary Key)

name (Unique)

### **5. Drug Tags (Many-to-Many Relationship)**

**Links drugs with multiple tags.**

**Table: drug\_tags**

drug\_id (Foreign Key → drugs.drug\_id)

tag\_id (Foreign Key → tags.tag\_id)

Primary Key

Composite Key (drug\_id, tag\_id)

#### **Relationship**

A drug can have multiple tags

A tag can belong to multiple drugs

### **6. Invoices**

**Represents sales transactions created by admins.**

**Table: invoices**

invoice\_id (Primary Key)

admin\_id (Foreign Key → admins.admin\_id)

invoice\_time

total\_amount

tax\_amount

discount\_amount

change\_amount

## (SRS Doc of Pharmacy Management System)

### Relationship

One admin can create many invoices

If an admin is deleted, admin\_id is set to NULL

### 7. Invoice Items

**Stores individual drug items sold in each invoice.**

#### Table: invoice\_items

item\_id (Primary Key)

invoice\_id (Foreign Key → invoices.invoice\_id)

drug\_id (Foreign Key → drugs.drug\_id)

quantity

### Relationship

One invoice can contain many items

Each item references one drug

Deleting an invoice deletes its items (CASCADE)

### Entity Relationships Summary

Admins → Admin Logs: One-to-Many

Admins → Invoices: One-to-Many

Invoices → Invoice Items: One-to-Many

Drugs → Invoice Items: One-to-Many

Drugs ↔ Tags: Many-to-Many (via drug\_tags)

### Business Rules Enforced by the Database

- Drug quantities must be greater than zero.
- User roles and drug types are restricted using CHECK constraints.
- Barcodes, usernames, emails, and tag names must be unique.
- Automatic timestamps are recorded for auditing purposes.
- Inventory thresholds (low\_amount) support stock monitoring.

## Entity Relationship Diagram (ERD):

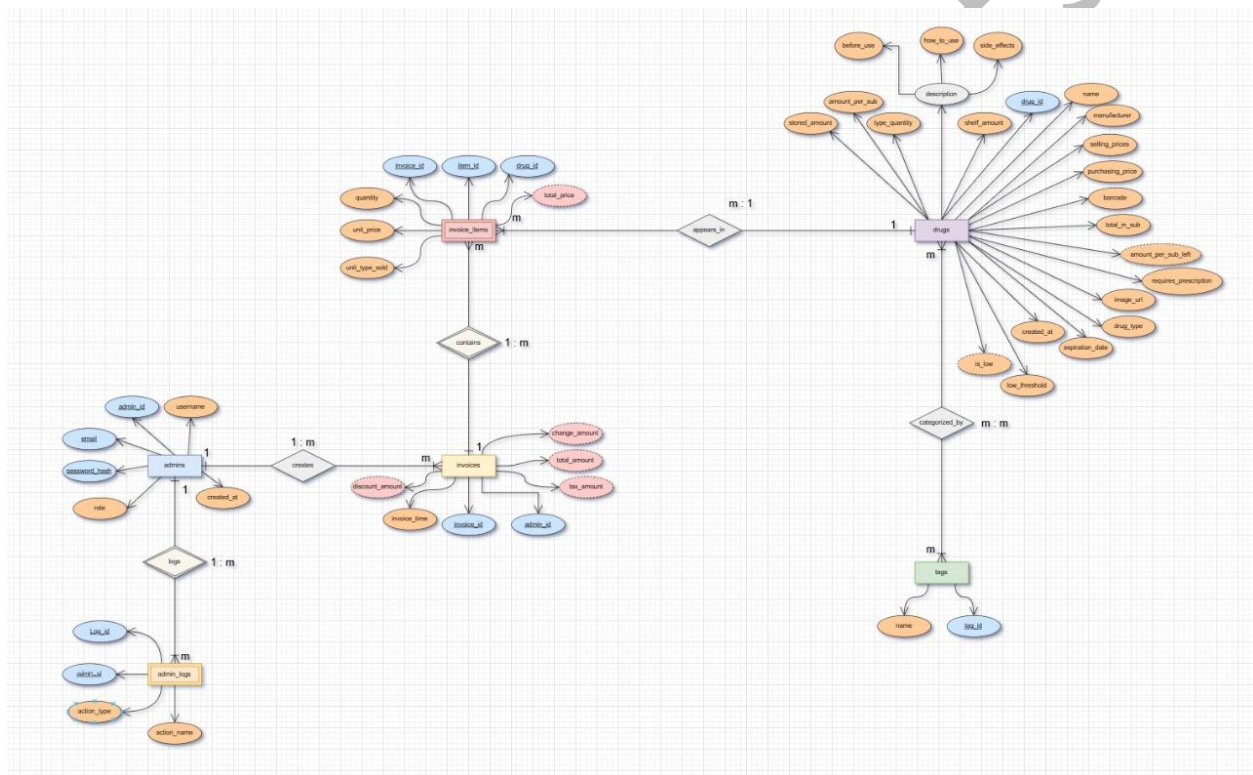


Figure 2

## Class Diagram:

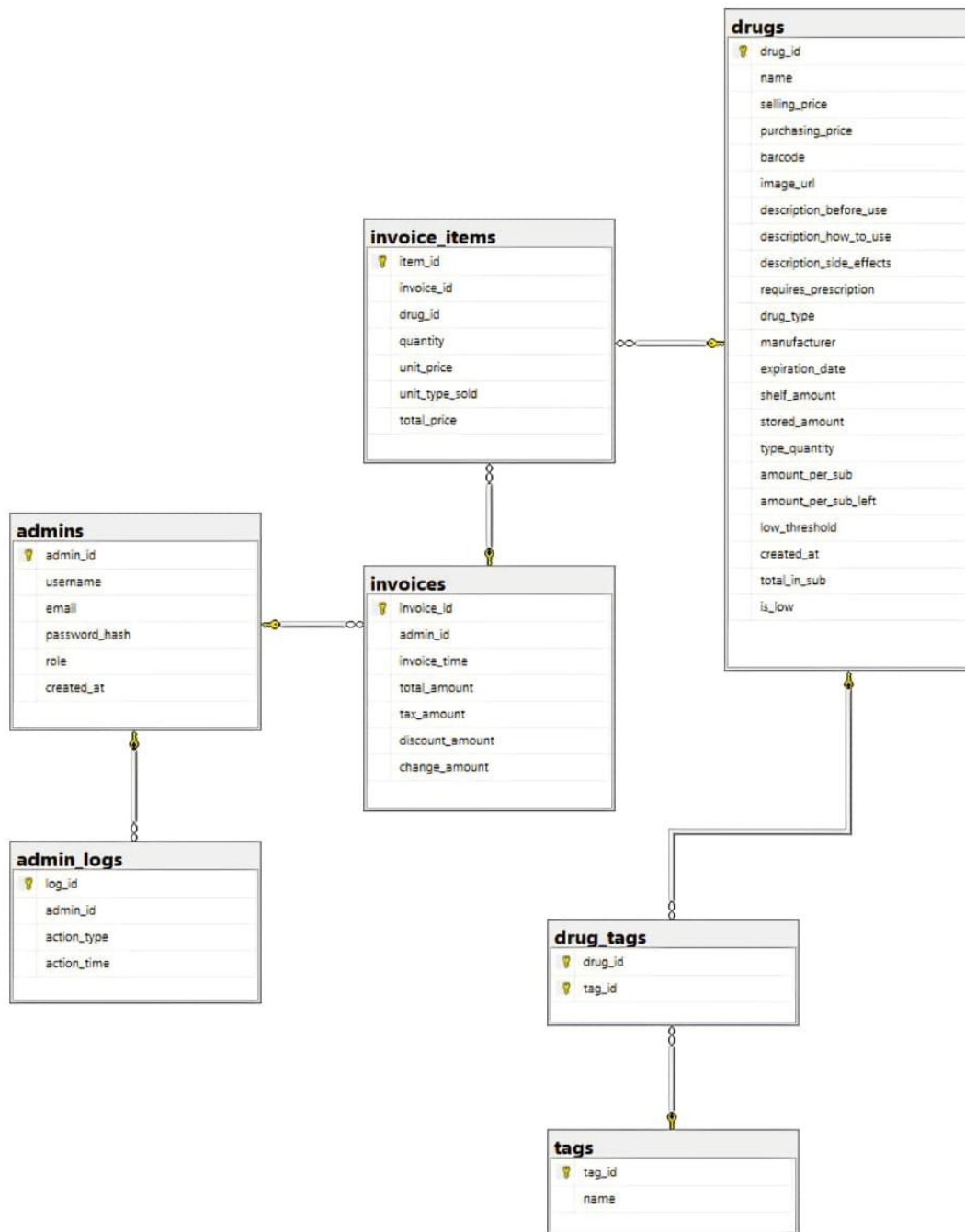


Figure 3

## 10. Required UI Screens

The Pharmacy Management System is a web-based system that provides multiple user interface (UI) screens to support different users and system functionalities. Each screen is designed to be simple, secure, and easy to use while ensuring efficient pharmacy operations.

The system shall include the following user interface screens:

### 10.1 Login Screen (Employees Only)

**Purpose:**

Allows authorized pharmacy staff to securely access the internal system.

**Features:**

- Username input field
- Password input field (masked)
- Login button
- Error messages for invalid credentials
- Role-based redirection after login

**Users:**

Admin

---

### 10.2 Dashboard Screen

**Purpose:**

Provides an overview of system status and quick access to core modules.

**Features:**

- Summary cards showing:
    - Total medicines
    - Low-stock medicines
    - Near-expiry medicines
    - Daily sales summary
  - Navigation menu to all system modules
-

## (SRS Doc of Pharmacy Management System)

- Alerts and notifications

### **Users:**

Admin

---

### **10.3 Inventory Management Screen**

#### **Purpose:**

Allows staff to view and manage all medicines in the pharmacy.

#### **Features:**

- List of all medicines in a table format
- Search and filter by name, category, or expiration date
- Stock level indicators (Normal / Low / Out of stock)
- Buttons to add, edit, or view medicine details

### **Users:**

Admin

---

### **10.4 Add / Edit Medicine Screen**

#### **Purpose:**

Used to add new medicines or update existing medicine information.

#### **Features:**

- Input fields for:
    - Medicine name
    - Barcode
    - Category
    - Type
    - Manufacturer
    - Expiration date
    - Quantity
-

## (SRS Doc of Pharmacy Management System)

- Prices
- Supplier
- Storage location
- Input validation and required field checks
- Save and cancel buttons

### **Users:**

Admin

---

## **10.5 Sales & Billing Screen**

### **Purpose:**

Handles medicine sales and invoice creation.

### **Features:**

- Medicine search bar
- Medicine selection list with available quantity
- Invoice item table (medicine, quantity, price)
- Automatic total calculation (no discounts)
- Confirm sale button

### **Users:**

Admin

---

## **10.6 Invoice Preview & Print Screen**

### **Purpose:**

Displays the final invoice before printing or saving.

### **Features:**

- Invoice ID
  - Date and time
  - List of purchased medicines
-

## (SRS Doc of Pharmacy Management System)

- Total amount
- Print and save options

### Users:

Admin

---

## 10.7 Public Medicine Search Screen (No Login Required)

### Purpose:

Allows customers to check medicine availability without creating an account.

### Features:

- Search by medicine name or category
- Display:
  - Medicine name
  - Price
  - Availability status
  - Type
  - Prescription requirement
- No data collection or user tracking

### Users:

Public customers

---

## 10.8 Session Timeout & Logout Screen

### Purpose:

Ensures system security after inactivity.

### Features:

- Automatic logout message
- Redirect to login screen

### Users:

Admin

---

## Real Screens For the Admin Part:



Figure 4

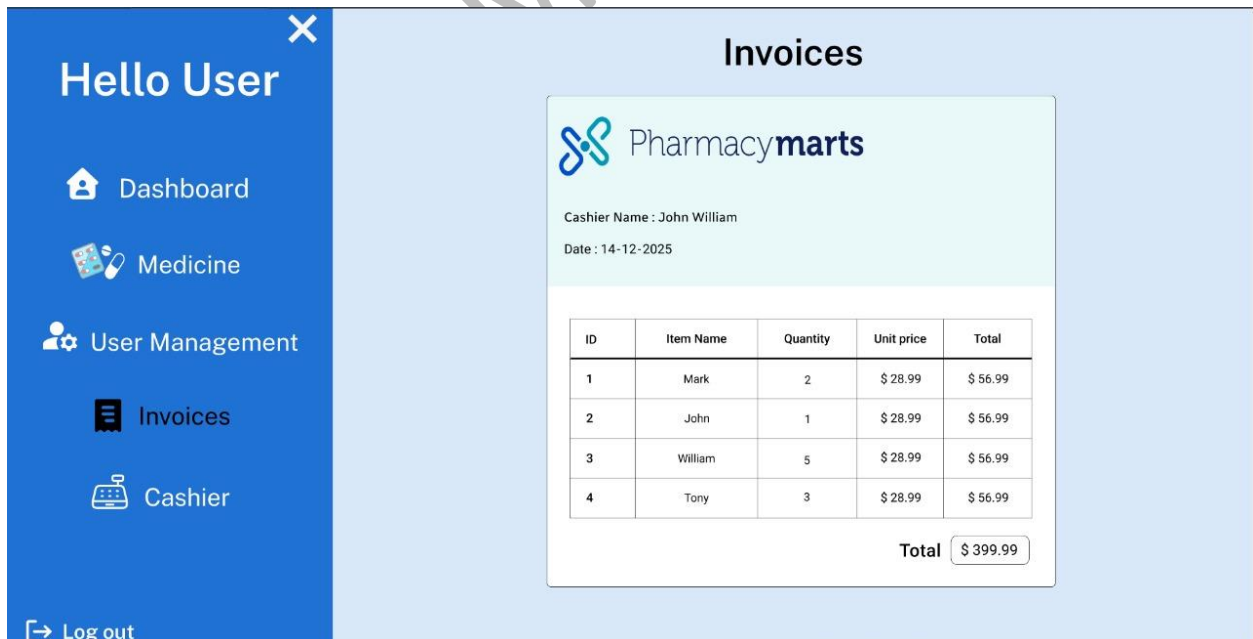


Figure 5

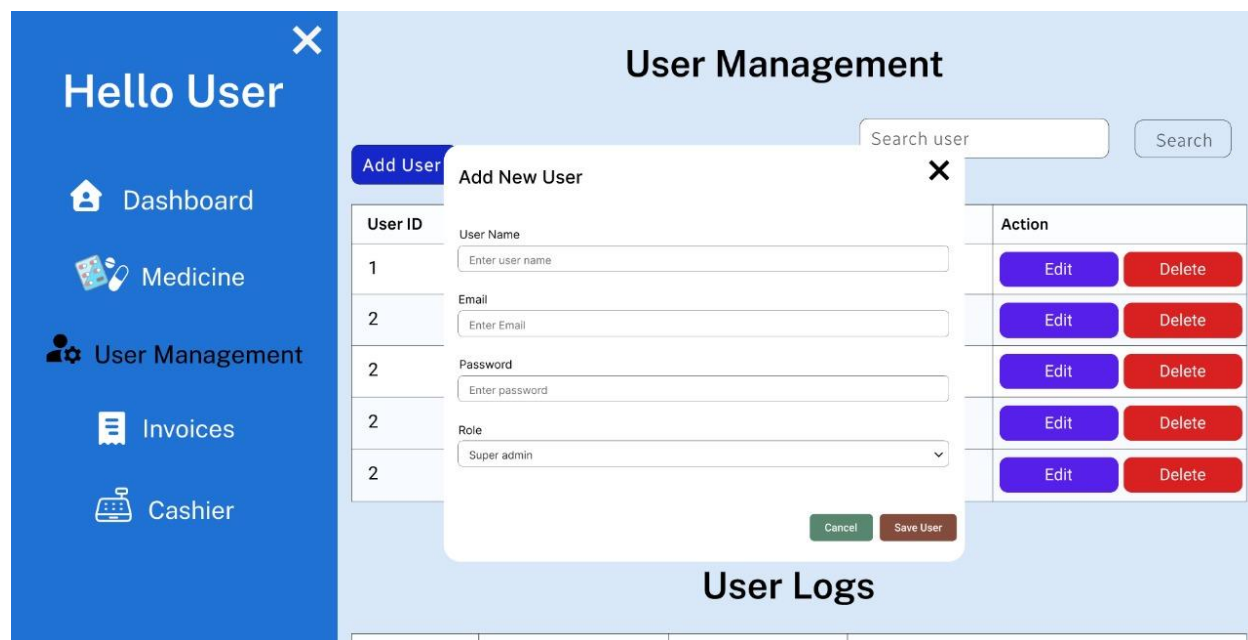


Figure 6

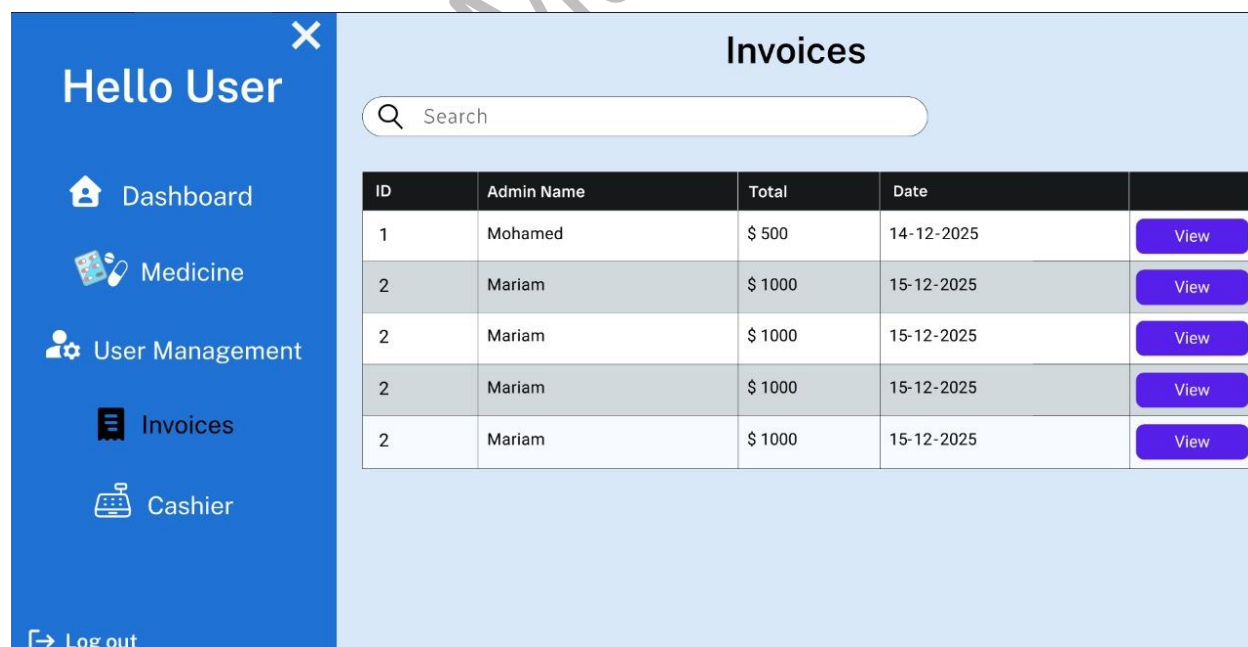


Figure 7

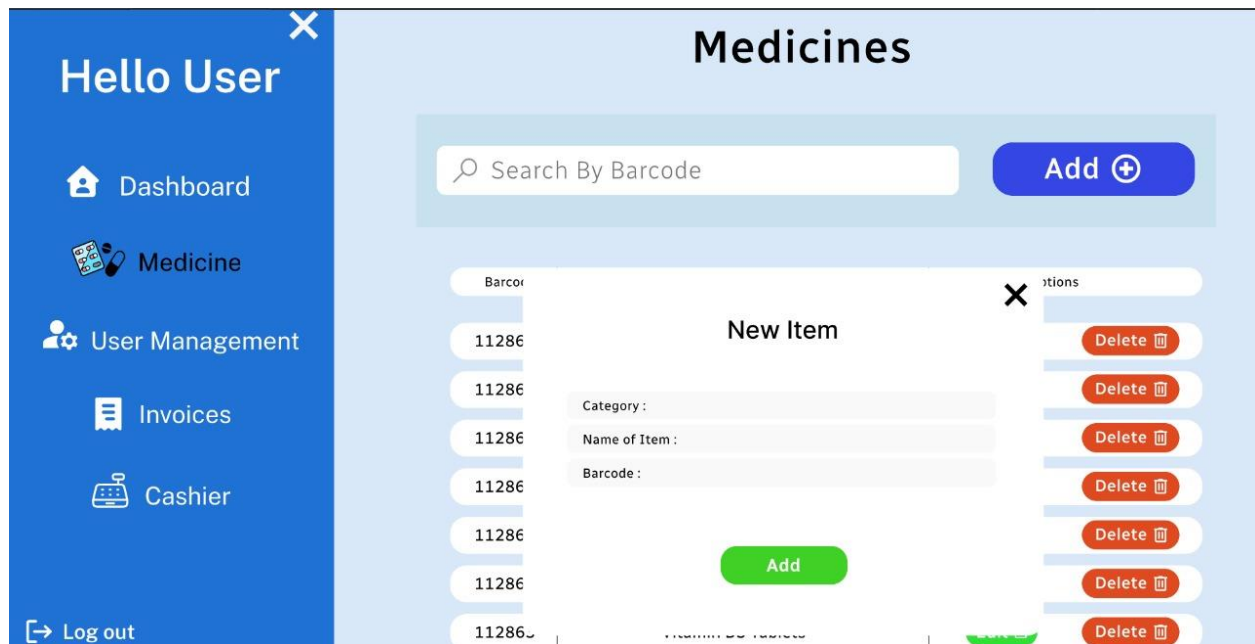


Figure 8

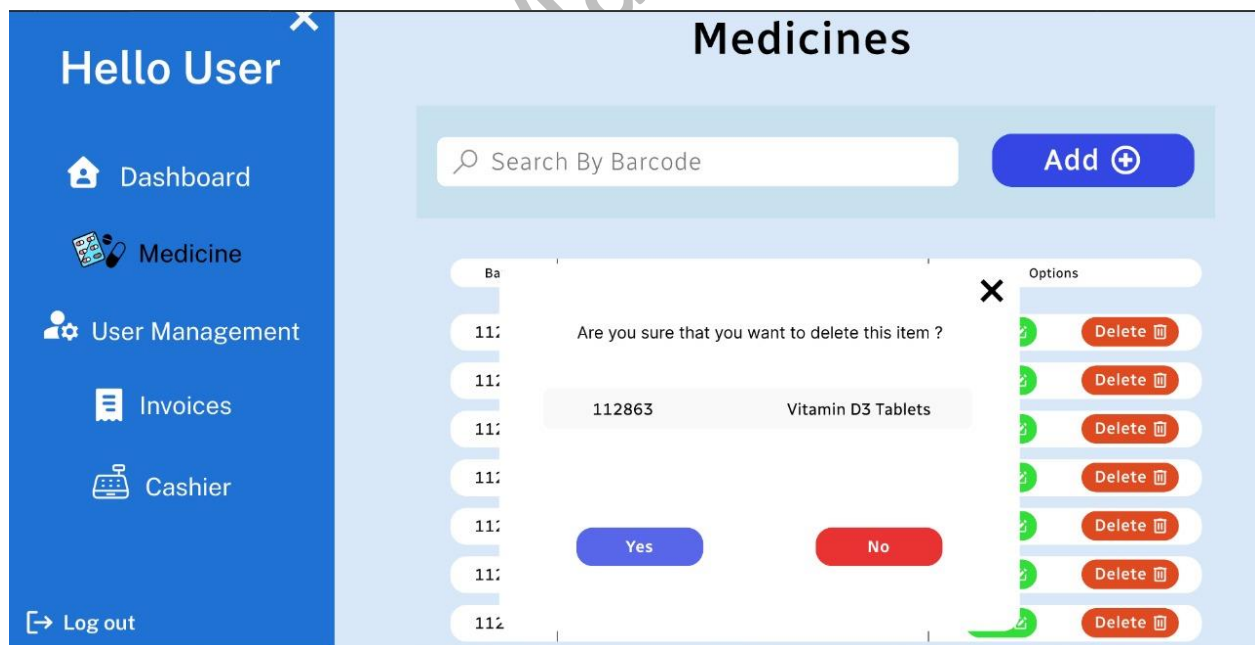


Figure 9

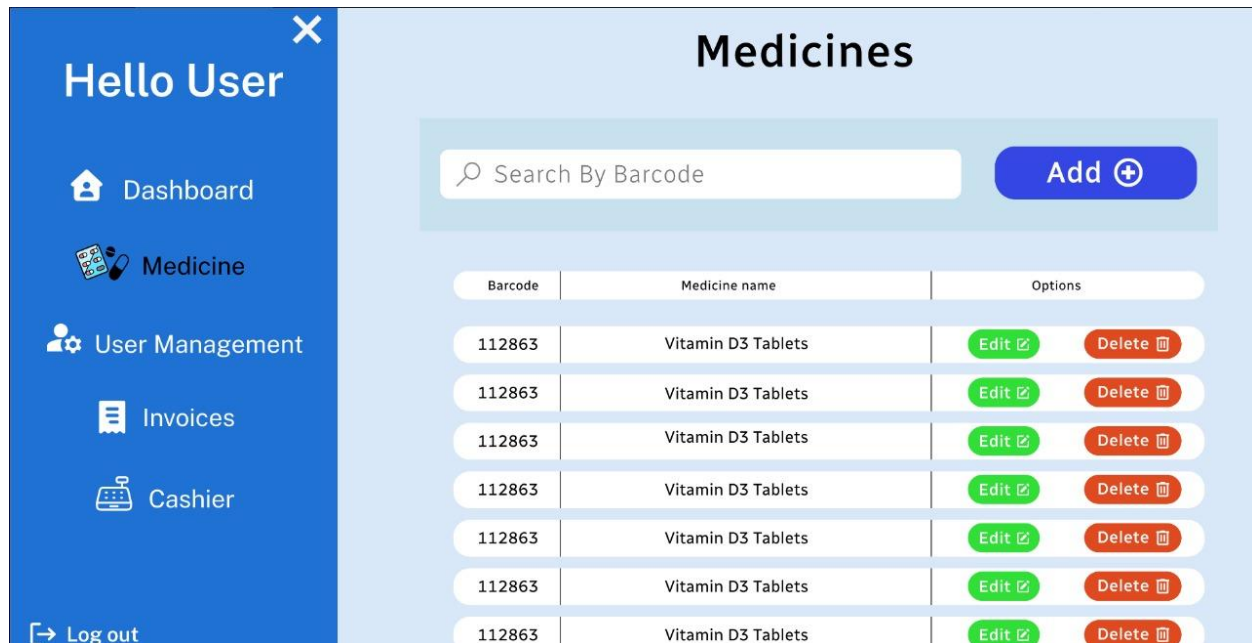


Figure 10

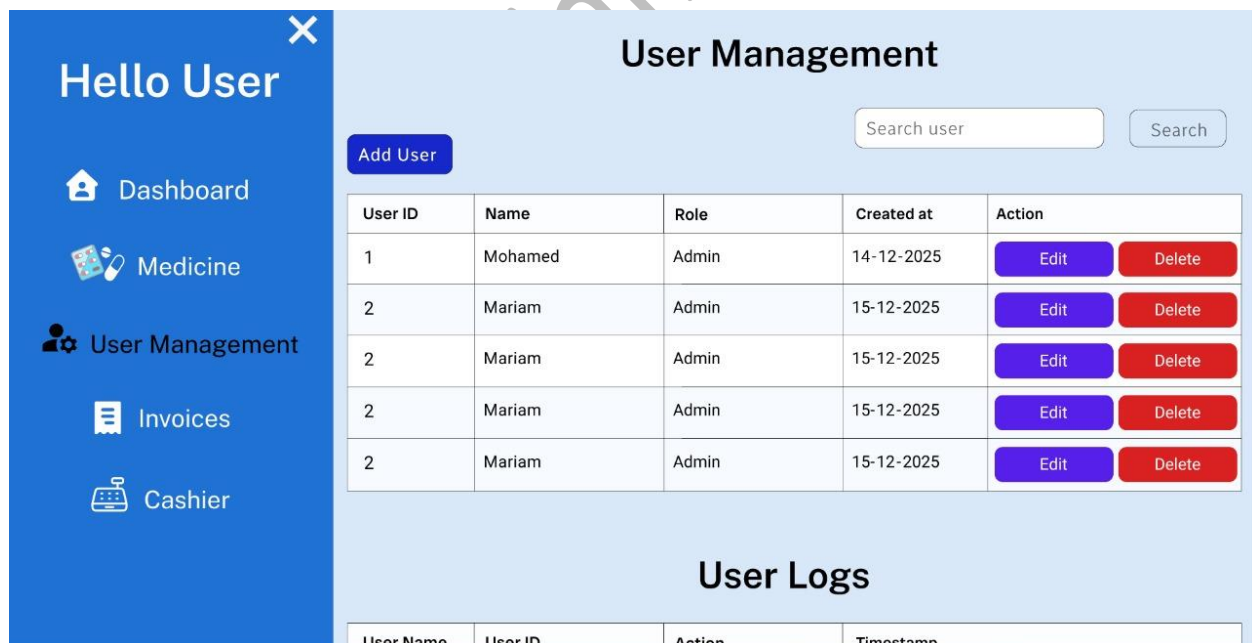


Figure 11

## (SRS Doc of Pharmacy Management System)

The screenshot shows the 'User Management' section of the system. On the left is a blue sidebar with icons for 'Invoices' and 'Cashier', and a 'Log out' button at the bottom. The main content area displays a table of users and a 'User Logs' section below it.

User ID	User Name	Role	Timestamp	Action
2	Mariam	Admin	15-12-2025	Edit Delete
2	Mariam	Admin	15-12-2025	Edit Delete
2	Mariam	Admin	15-12-2025	Edit Delete

### User Logs

User Name	User ID	Action	Timestamp
Mohamed	1	Login	14-12-2025 00:00
Mariam	2	Logout	15-12-2025 00:00
Mariam	2	Logout	15-12-2025 00:00
Mariam	2	Login	15-12-2025 00:00
Mariam	2	Logout	15-12-2025 00:00

Figure 12

## Real Screens for the Customer Part:

The screenshot shows the homepage of the 'PharmacyMarts' website. The header includes the logo, navigation links (Home, Categories, Services, Contact us), and a search bar. The main banner features a background image of a pharmacy aisle with the text 'Welcome to Pharmacy' and a tagline: 'Your trusted partner for health and wellness needs. Explore our wide range of pharmaceutical products and services designed to support your well-being.'

Figure 13

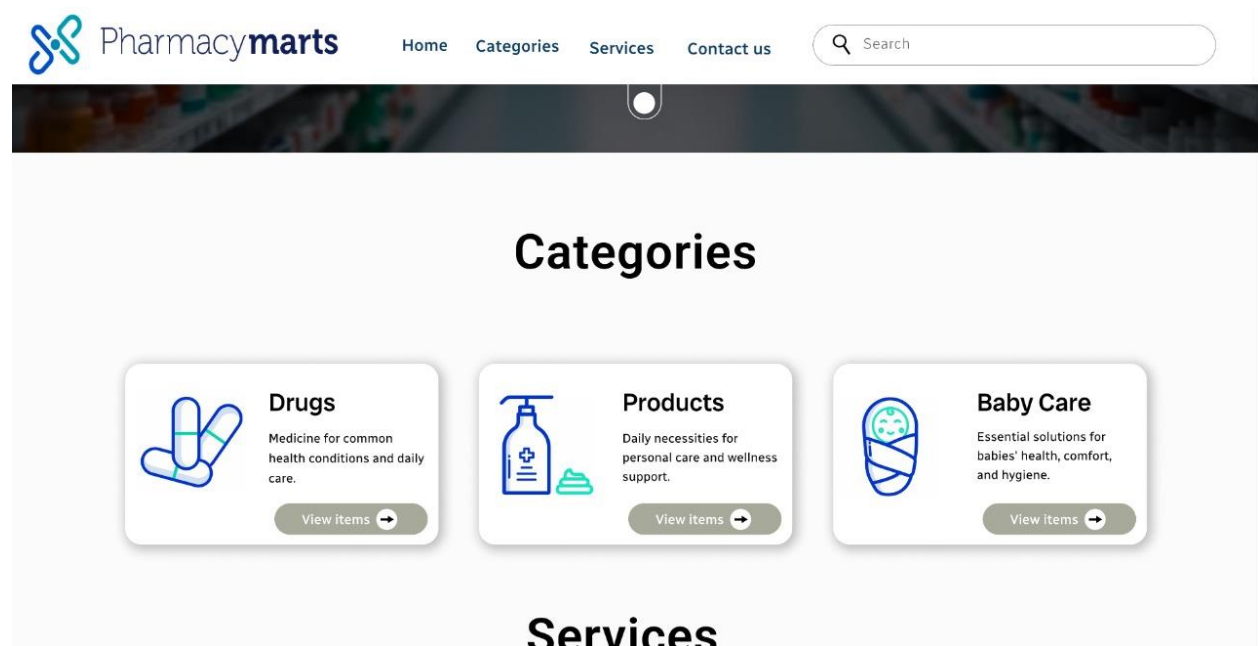


Figure 14

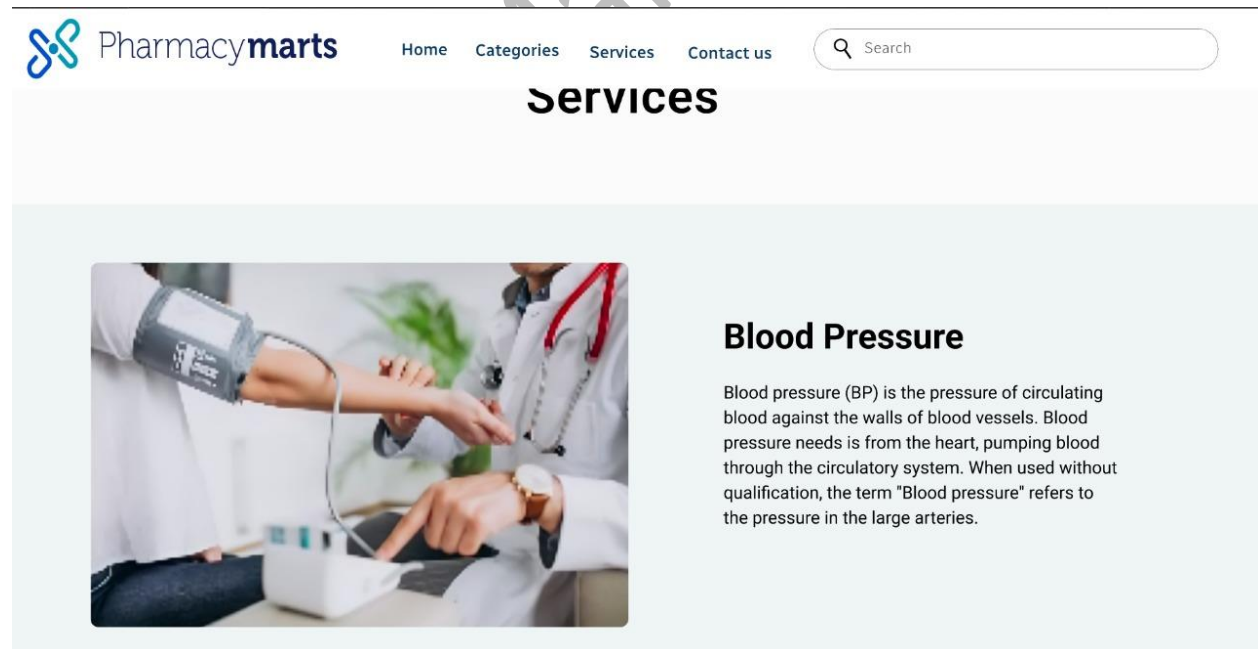


Figure 15

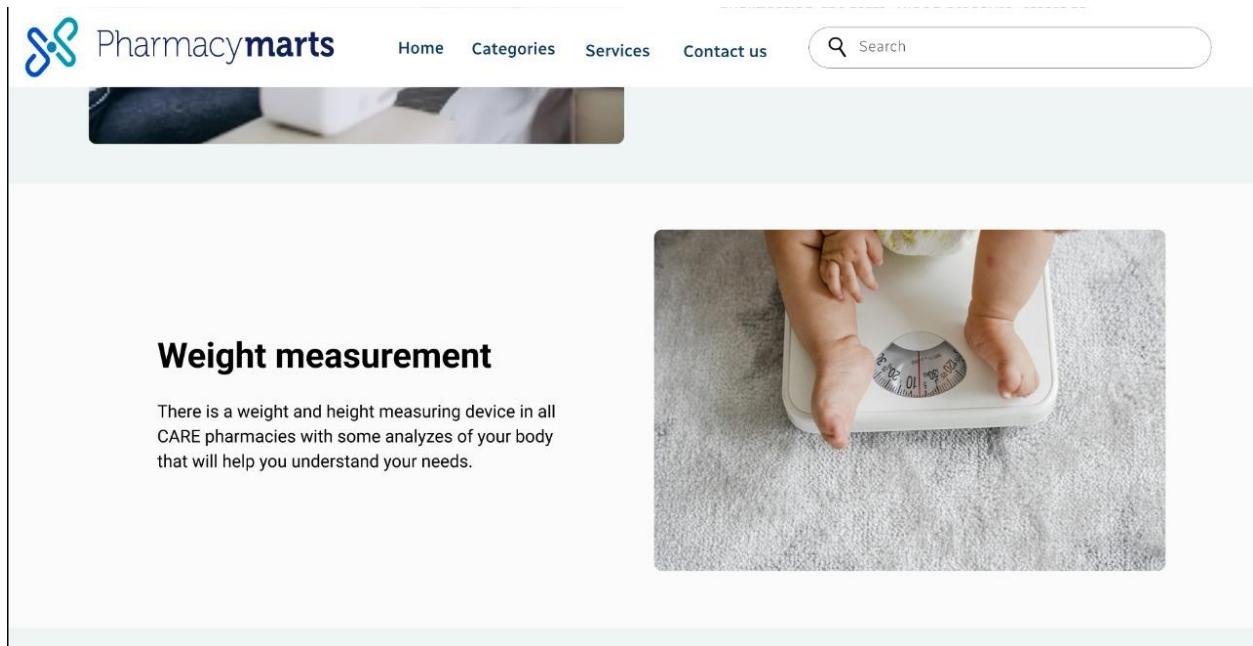


Figure 16

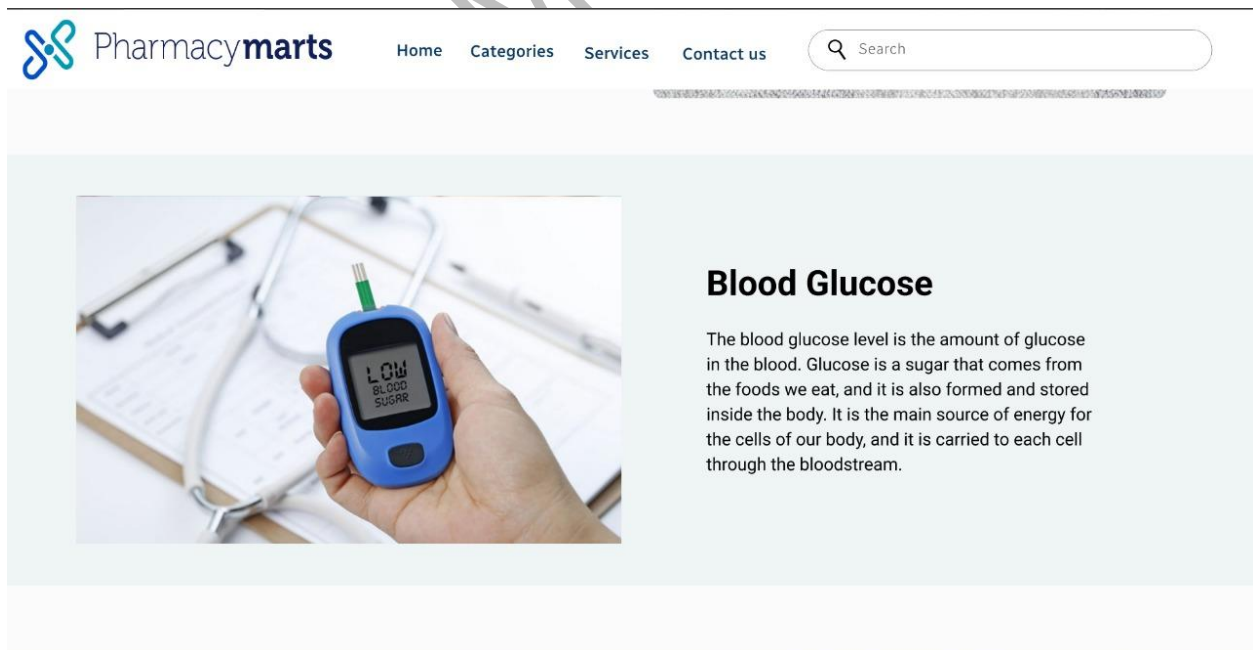


Figure 17

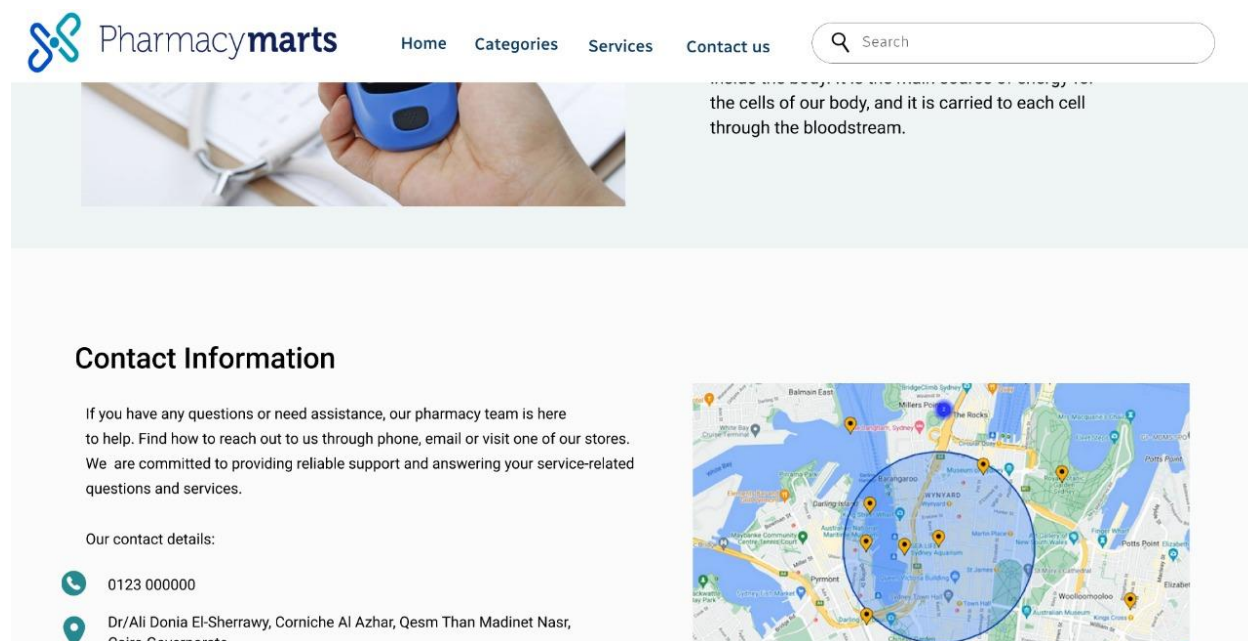


Figure 18

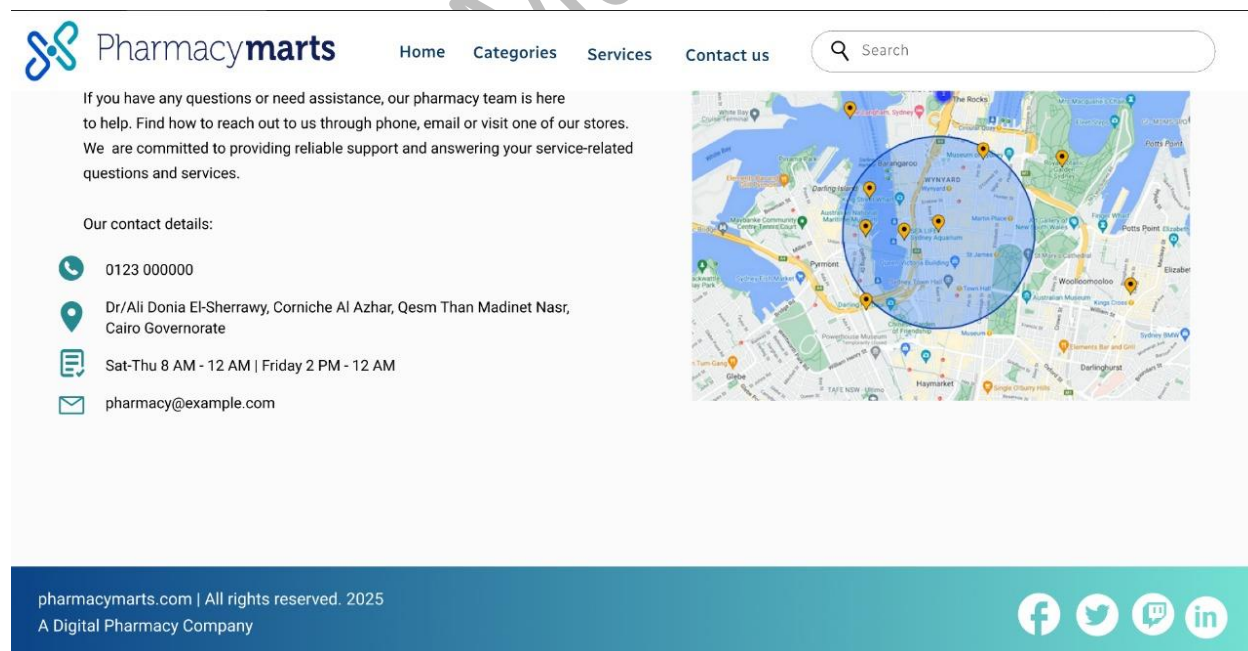


Figure 19

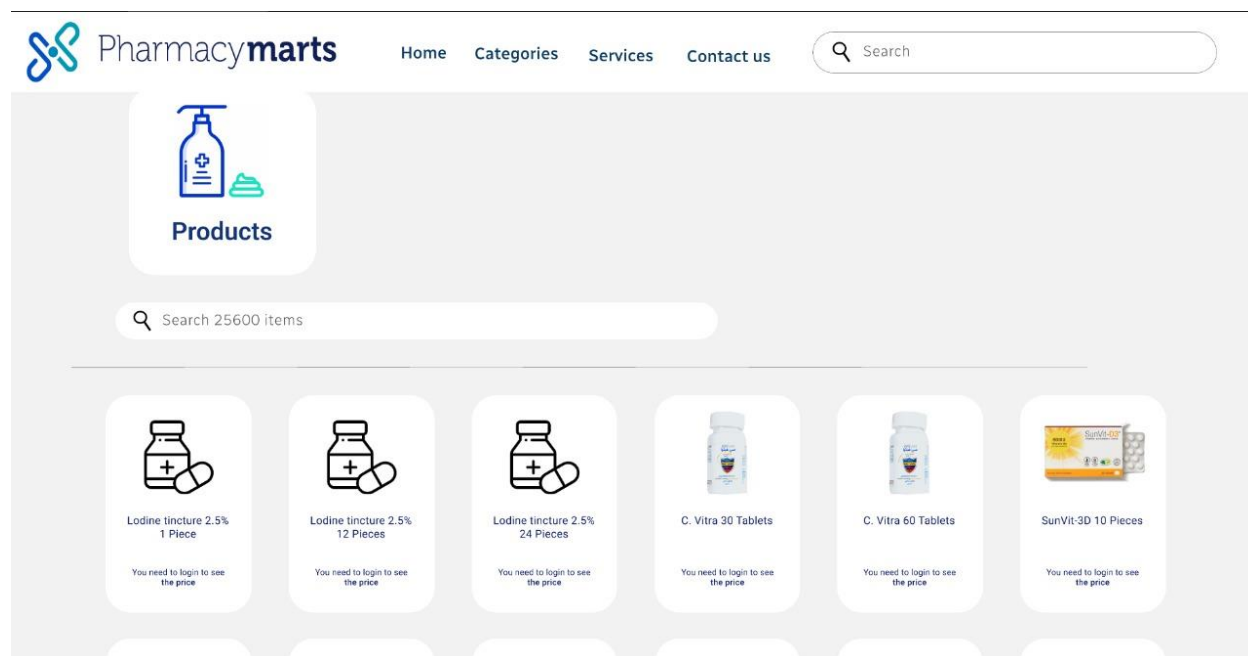


Figure 20

## 11. High-Impact Risks Related to Development

This section identifies the most significant risks that may affect the development, deployment, and operation of the Pharmacy Management System, along with mitigation strategies to reduce their impact.

### 11.1 Technical Risks

**Risk:** Data loss due to system failure, hardware malfunction, or unexpected shutdowns.

**Impact:**

Loss of inventory data, sales records, or employee activity logs could disrupt pharmacy operations and affect data accuracy.

**Mitigation:**

- Implement automatic data saving after every critical operation.
- Perform regular database backups on a scheduled basis.
- Use transaction management to ensure data consistency during failures.

## 11.2 Security Risks

**Risk:** Unauthorized access to the system by non-authorized users.

**Impact:**

Unauthorized users could modify inventory, access sensitive employee data, or manipulate sales records.

**Mitigation:**

- Enforce role-based access control for all system modules.
  - Encrypt all stored passwords using secure hashing techniques.
  - Automatically log and monitor all employee activities.
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## 11.3 Time and Schedule Risks

**Risk:** Limited time available for development and testing.

**Impact:**

Incomplete implementation, reduced testing coverage, or delayed project submission.

**Mitigation:**

- Use incremental development to deliver features in small, manageable phases.
  - Define clear milestones and deadlines for each increment.
  - Prioritize core system functionality before optional features.
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## 11.4 Data Accuracy Risks

**Risk:** Incorrect or inconsistent inventory data due to human error or system issues.

**Impact:**

Incorrect stock levels may lead to selling unavailable medicines or failing to detect low-stock and expired items.

**Mitigation:**

- Automatically update inventory quantities after each sale or supply entry.
  - Validate all data inputs before saving.
  - Prevent manual modification of calculated fields.
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### 11.5 User Error Risks

**Risk:** Incorrect data entry by pharmacy employees.

**Impact:**

Incorrect medicine information, wrong pricing, or inaccurate reports.

**Mitigation:**

- Implement input validation and mandatory fields.
  - Display confirmation dialogs before critical actions.
  - Provide clear error messages and system feedback.
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### 11.6 Performance Risks

**Risk:** System slowdown during peak usage times.

**Impact:**

Delayed sales processing and reduced user satisfaction.

**Mitigation:**

- Optimize database queries and indexing.
  - Monitor system performance regularly.
  - Limit unnecessary background operations.
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**Thank you so much for your interesting and  
attention.**